

Madhusudhanan Chandrasekaran

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Objective

Seeking a suitable full-time opportunity where I could apply my prior research skills and experience.

Education

- **University at Buffalo** *Buffalo, NY*
Ph.D. in Computer Science *expected in December 2008*
Thesis : An Introspective Behavior-based Methodology to Mitigate Internet Attacks.
Advisor: Dr. Shambhu Upadhyaya
- **University at Buffalo** *Buffalo, NY*
M.S. in Computer Science *September 2004*
Thesis : Sequential Hypothesis Testing for Reasoning about Intrusions
Advisor: Dr. Shambhu Upadhyaya
- **University of Madras** *Madras, India*
B.E. in Computer Science and Engineering *May 2002*
Thesis : Study and Simulation of Zone Routing Protocol for MANETs
Advisor: Prof. Robert Masillamani

Work Experience

- **Amazon Inc** *Seattle, WA*
Summer Intern *May 2008 - August 2008*
Project : Feedback Text Mining to Detect Fraudulent Sellers
Mentor : Dr. Rich Wasserman
 - Designed and implemented a text mining engine using linguistic approaches to detect fraudulent sellers based on buyers' feedback text. Built a system to classify cluster poor performing sellers into different categories according to their shortcomings.
- **Google Inc** *Mountain View, CA*
Summer Intern *May 2006 - August 2006*
Project : Payment Fraud and Risk Engineering
Mentor : Rob Renfrew

- Researched on the effect of employing anti-spam signals for fraud detection. Revamped the existing automated reasoning framework to provide elaborate reasoning in the event of an account deemed suspicious by the classification engine. Assisted in building an automated request generator to load test the risk servers.

- **Google Inc**

Summer Intern

Project : Fuzz Testing Ads RPC servers

Mentor : Dr. Arash Baratloo

Mountain View, CA

May 2005 - August 2005

- Single handedly designed, implemented, experimented with an automated tool to help test ad-backend servers. The tool was customized to test various internal production servers at execution time.

Research Experience

- **University at Buffalo**

Graduate Assistant

Buffalo, NY

January 2003 - present

- Researched computer security, with focus on building systems resilient to both internal and external attacks
 - ◇ **Sequential hypothesis testing for Intrusion detection:** Involved in building and testing DRUID, a statistical anomaly detection system developed at University at Buffalo. Developed a modified version of sequential hypothesis testing for detecting masqueraders. Collaboratively developed RACOON, a synthetic data generation tool, to overcome the overhead associated with IDS data collection and to expedite the training phase.
 - ◇ **PHONEY : Mimicking user response to detect phishing attacks:** Proposed a novel approach to detect phishing attacks using fake responses which mimic real users, essentially, reversing the role of the victim and the adversary. Results of this work are being implemented and tested as a browser helper object. Also, developed machine learning based algorithms to detect phishing websites and emails based on linguistic feature set.
 - ◇ **CUSP: Customizable and usable spam filters to detect phishing attacks** By extracting the “tone” of a phishing email generated warning messages to dissuade users from responding to the phishing email. This is implemented as plug-in to Microsoft Outlook.
 - ◇ **Adroit : Automatic defense against zero-day exploits:** Designed and developed an automatic notification system that crawls across various bug reporting databases to report vulnerabilities pertinent to the current system configuration. Investigating various defense and recovery strategies against zero-day exploits.
 - ◇ **Spycon: Emulating user activities to detect evasive spyware** Developed a flow-based technique using machine learning algorithms to detect spyware programs that leak out user information.

Papers

1. Madhusudhanan Chandrasekaran, Vidyaraman Shankaranarayanan, Shambhu Upadhyaya, ”CUSP: Customizable and Usable Spam Filters To Detect Phishing Attacks”, NYS Cyber Security Conference 2008.

2. Madhusudhanan Chandrasekaran, Krishnan Narayanan, Shambhu Upadhyaya, "Phishing Email Detection based on Structural Properties", NYS Cyber Security Conference 2006.
3. Madhusudhanan Chandrasekaran, Ramkumar Chinchani, Shambhu Upadhyaya, "PHONEY: Mimicking User Response to Detect Phishing Attacks", Second International Workshop on Trust, Security and Privacy for Ubiquitous Computing (TSPUC), affiliated with IEEE WoWMoM 2006.
4. Madhusudhanan Chandrasekaran, Shambhu Upadhyaya, "A Multistage Framework to Defend Against Phishing Attacks", to appear as a book chapter in Handbook of Research on Social and Organizational Liabilities in Information Security Vulnerability Aggregation and Forensics, 2007.
5. Madhusudhanan Chandrasekaran, Mukarram Baig, Shambhu Upadhyaya, "AVARE: Automatic Vulnerability Aggregation and Response against Zero-day Attacks", 1st International Swarm Intelligence & Other Forms of Malware Workshop (Malware 2006), affiliated with IEEE IPCCC 2006.
6. Madhusudhanan Chandrasekaran, Mukarram Baig, Shambhu Upadhyaya, "AEGIS: A Proactive Methodology to Shield Against Zero-day Exploits", IEEE International Symposium on UbiSafe Computing (UbiSafe) 2007.
7. Madhusudhanan Chandrasekaran, Vidyaraman Shankararayanan, Shambhu Upadhyaya, "Spycon: Emulating User Activities to Detect Evasive Spyware", 2nd International Swarm Intelligence & Other Forms of Malware Workshop (Malware 2007), affiliated with IEEE IPCCC 2007. (**Best paper award sponsored by RSA**).
8. Ramkumar Chinchani, Aarthie Muthukrishnan, Madhusudhanan Chandrasekaran, Shambhu Upadhyaya, "RACOON: Rapidly Generating User Command Data For Anomaly Detection From Customizable Templates", Annual Computer Security Applications Conference (ACSAC) 2004.
9. Vidyaraman Shankararayanan, Madhusudhanan Chandrasekaran, Shambhu Upadhyaya, "Towards Modeling Trust Based Decisions: A Game Theoretic Approach", European Symposium on Research in Computer Security (ESORICS) 2007.
10. A Novel Approach For Security and Robustness in Wireless Embedded Systems, Mohammad Husain, Shambhu Upadhyaya, Madhusudhanan Chandrasekaran, IFIP Workshop on Software Technologies for Future Embedded & Ubiquitous Systems 2008.
11. Mohit Virendra, Murtuza Jadliwala, Madhusudhanan Chandrasekaran, Shambhu Upadhyaya, "Quantifying Trust in Mobile Ad-Hoc Networks", IEEE International Conference Integration of Knowledge Intensive Multi-Agent Systems (KIMAS) 2005.
12. Duc Ha, Hung Ngo, Madhusudhanan Chandrasekaran, "CRESTBOT: A New Family of Resilient Botnets", IEEE Global Communication Conference (Globecom) 2008.
13. Vidyaraman Shankararayanan, Madhusudhanan Chandrasekaran, Shambhu Upadhyaya, "User is the Enemy", New Security Paradigm Workshop (NSPW) 2007.
14. Madhusudhanan Chandrasekaran, Ramkumar Chinchani, Shambhu Upadhyaya, "Towards A Host-Based Masquerade Detection System Using Sequential Hypothesis Testing", in submission to IEEE Transactions on Dependable and Secure Computing (TDSC).
15. Vijay Ganesh Hariharan, Bhuvaneshwari, Madhusudhanan Chandrasekaran, Anusuya Venugopal, "Parallelizing Probability based Protein Sequence Clustering Using Intelligent Job Allocation Mechanism", Summer Computer Simulation Conference (SCSC) 2003.

16. Vijay Ganesh, Bhuvaneshwari, Madhusudhanan Chandrasekaran, "A Distributed Algorithm to Align Distantly Related Protein Sequence Using Profile Analysis", IEEE Tencon 2003.

Talks

- **Google Inc** *Mountain View, CA*
 - Presented Fuzzball : Automatic testing of Ads backend RPC server.
 - Talk on Phishing attack defenses to the Risk Engineering Group.
- **University at Buffalo** *Buffalo, NY*
 - Talk on Sequential Hypothesis Testing for masquerade detection.
 - Talk on automatic patch management as a part of security seminar.

Teaching Experience

- **University at Buffalo** *Buffalo, NY*
Teaching Assistant for four undergraduate courses *Aug 2004 - current*
 - Assisted in teaching undergraduate/graduate level courses such as Java, Operating Systems Internals, Introduction to Microprocessors and Data Structures.
 - Conducted laboratory sessions, assisted students with projects, graded exams and assignments, and prepared model answer sets.

Projects

- Created MySQL a mini database system using JAVA which supports primitive DDL commands like create table, create index, drop table and DML commands like insert, delete and select. Indexing and B+ Trees were implemented for efficient storage.
- Developed a visualization tool for generating UML Time Sequence Diagrams from a given JAVA trace file, to assist debugging.
- Developed a client/server based online-chat messenger using UDP and curses in C.
- Developed Transaction Processing System using J2EE technology incorporating session, entity and message driven beans
- Simulated Circuit Switching and Packet Switching techniques in a subnet of six nodes using OPNET and analyzed the performance characteristics like Throughput and End to End delay were analyzed.
- Simulated Eight Bit Carry Lookahead and Ripple Carry Adder in Verilog.
- Conducted study of all common network attacks like Land Attack, Neptune, Ping O death, Process table attack, Targa3, Smurf attack, Syslogd attack, Teardrop and UDP storm attacks.
- Implemented an in kernel process mailbox in FreeBSD 5.2 kernel.
- Implemented a simple access control list (ACL) for MYFS in FreeBSD 5.2 kernel.
- Implemented and compared the storage performance of Modified Quadtree for region based image representation.

Professional Service

- Technical program committee for APWG Conference 2008, GLOBECOM 2009.
- Refereed papers for the following conferences and symposia: IWIA 2005, DSN 2007, SRDS 2007, SRDS 2008.

Awards

- Research Assistant and tuition Scholarship, University at Buffalo.
- Teaching Assistant and tuition Scholarship, University at Buffalo.
- Won second prize in computer security quiz competition, Polytechnic University, NY
- Won first prize in several national level (India) debugging and technical quiz competitions.
- Secured University first rank in fourth semester and stood overall second in class of 120 during undergraduate study.

References

- Available upon request